

IN THE SPECIFICATION:

Please replace the Summary of Invention section on page 2, line 26 through page 7, line 20 with the following amended section:

--The present invention has been made to solve the above-described conventional problems, and has its object to provide a high-quality image processing apparatus and image processing method capable of image transfer processing by using a fixed size work buffer, even if different decoding methods are used, without physically increasing the memory.

To attain the above object, the present invention provides an image processing apparatus comprising: first coding means for performing coding by band having a predetermined height; first decoding means for decoding data coded by said first coding means into bitmap data; memory means for storing bitmap data for one band decoded by said first decoding means; second coding means for encoding the bitmap data stored in said memory means by a coding method selected from plural coding methods; and second decoding means for selecting and performing a first decoding method capable of transferring the bitmap data to a printer engine in realtime, or a second decoding method which needs to render the bitmap data before transferring the data to the printer engine, in accordance with the coding method selected by said second coding means, wherein before coding is performed by said first coding means, decoding processing performed by said second decoding means is predicted, and if the predicted decoding processing is the second decoding processing, the band height is reduced to half of that in case of the first decoding processing; and a method therefor.

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Further, the present invention provides an image processing apparatus

comprising: memory means including a first area for storing coded representation of image data and a second area for storing raster image data of at least a band; coded-representation forming means for translating respective image data of plural bands into coded representation and storing the coded representation into said first area of said memory means; rendering means for rendering the coded representation from said first area into said second area, in said memory means; coding means for encoding the raster image data rendered in said second area into coded data and storing the coded data by page in said memory means; decoding means for decoding said coded data; decoding-method discrimination means for discriminating whether decoding method performed by said decoding means is a first decoding method capable of transferring decoded raster image data to a printer engine in real time, or a second decoding method for rendering the decoded raster image data in a memory and then transferring the data to the printer engine; and band-height setting means for setting a band height based on the result of discrimination by said decoding-method discrimination means.

If decoding is performed by said second decoding method in accordance with the result of discrimination by said decoding-method discrimination means, said band-height setting means sets the band height to half of that of the first decoding method.

The image processing apparatus further comprises input means for inputting image data in page description language.

The coded-representation forming means converts said page description language into coded representation including at least one of a bitmap object, a run length object, a trapezoidal object, a box object, and a fixed-boundary code object.

The image processing apparatus further comprises age-type discrimination

means for discriminating an image type of said image data, wherein said coding means selects a coding method corresponding to the image type discriminated by said image-type discrimination means from plural coding methods and performs coding by the selected coding method.

The image processing apparatus further comprises release means for releasing said first area in which said coded representation is stored after generation of coded page by said coding means.

Further, the present invention provides an image processing method for encoding input image data in band units and storing coded data for one page, then transferring the coded data to a printer engine while decoding the data, comprising: a discrimination step of discriminating whether or not a decoding method for temporarily rendering decoded raster image data in a memory and then transferring the data to the printer engine is used, based on input image data; and a band-height setting step of, if it is discriminated at said discrimination step that said decoding method is used, setting a band height to half of that where said decoding method is not used.

The image processing method further comprises: a translation step of translating the input image data into coded representation by each band having the height set at said band-height setting step; a first storage step of storing said coded representation; a rendering step of rendering the stored coded representation by band into a band raster image; a second storage step of storing said rendered band raster image; a coding step of encoding the stored band raster image and storing said coded data for one page; and decode and transfer steps of temporarily rendering coded data by band and then transferring the rendered data to a printer engine.

At said decoding and transfer step, a memory for two-band raster images is used as a double buffer, and decode and transfer steps are performed in parallel.

Further, the present invention provides a storage medium containing program code, read and executed by a computer, to function as an image processing apparatus which encodes input image data by band and stores coded data for one page, and transfers the coded data to a printer engine while decoding the data, said program code including program code for discriminating whether or not a decoding method for temporarily rendering decoded raster image data in a memory and then transferring the data to the printer engine is used, based on input image data, and band-height setting program code for, if it is discriminated that said decoding method is used, setting a band height to half of that where said decoding method is not used.

Other features and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which like reference characters designate the same name or similar parts throughout the figures.--